

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF DELAWARE**

CORTEVA AGRISCIENCE LLC,)	
)	
Plaintiff,)	
)	
v.)	C.A. No. _____
)	
MONSANTO COMPANY and BAYER)	JURY TRIAL DEMANDED
CROPSCIENCE LP,)	
)	
Defendants.)	
)	

COMPLAINT FOR PATENT INFRINGEMENT

Plaintiff Corteva Agriscience LLC (“Corteva” or “Plaintiff”), by and through its undersigned attorneys, hereby commences this action for patent infringement against Monsanto Company and Bayer CropScience LP (collectively, “Defendants”), and alleges as follows:

I. NATURE OF THE ACTION

1. This is an action for infringement of United States Patent No. 10,947,555 (“the ’555 patent”) arising under the patent laws of the United States, 35 U.S.C. § 100 *et seq.*

2. The ’555 patent is directed to Corteva’s invention of transgenic (genetically modified) plants and plant cells that produce AAD-1 enzymes conferring resistance to two different classes of herbicides with different modes of action: phenoxy auxin herbicides (e.g., 2,4-D) and (R)-aryloxyphenoxypropionate herbicides (e.g., quizalofop). Corteva’s invention, commercialized in Corteva’s Enlist® branded corn products, enables growers to use multiple types of herbicides to control weeds, including glyphosate-resistant weeds that are resistant to Monsanto’s glyphosate herbicide, Roundup®.

3. With knowledge of Corteva’s invention, Defendants have made and used transgenic plants that produce an AAD-1 enzyme having dual activity against 2,4-D and

quizalofop. Defendants have renamed such AAD-1 enzymes as “FT” enzymes. Defendants have filed at least one application with the U.S. Department of Agriculture seeking nonregulated status to permit marketing of transgenic plants producing an AAD-1 (FT) enzyme in the United States (i.e., MON 87429 maize).

4. By making and using Corteva’s patented transgenic plants in the United States, Defendants have infringed the ’555 patent at least under 35 U.S.C. § 271(a).

II. THE PARTIES

5. Plaintiff Corteva Agriscience LLC is incorporated in Delaware with a place of business located at Chestnut Run Plaza, 974 Centre Road, Wilmington, Delaware 19805.

6. Corteva is one of the world’s largest commercial seed and plant producers. Corteva uses genetic research to develop crop plants designed to increase quantity, quality, and sustainability of yields for farmers, including herbicide-resistant transgenic maize hybrids and soybean varieties.

7. Corteva has received numerous patents in the United States and in other countries for its innovative discoveries, including the ’555 patent. Corteva owns, by valid assignment, all rights, title, and interest in the asserted ’555 patent.

8. Defendant Monsanto Company is incorporated under the laws of the State of Delaware. On information and belief, as reported in its filings with the United States Securities and Exchange Commission, Monsanto Company has a registered office at 251 Little Falls Drive, Wilmington, Delaware 19808-1674.

9. Defendant Bayer CropScience LP is organized and existing under the laws of the State of Delaware. On information and belief, Bayer CropScience LP also has a registered office at 251 Little Falls Drive, Wilmington, Delaware 19808-1674.

10. On information and belief, Defendants Monsanto Company and Bayer CropScience LP are wholly owned by Bayer AG and part of its Crop Science Division. On information and belief, Defendants are engaged in developing, producing, and selling crop seeds and plants, including herbicide-resistant transgenic plants.

III. JURISDICTION AND VENUE

11. This action arises under the patent laws of the United States, 35 U.S.C. § 100 *et seq.* This Court has subject matter jurisdiction pursuant to 28 U.S.C. §§ 1331 and 1338(a).

12. This Court has personal jurisdiction over Monsanto Company and Bayer CropScience LP, which have purposefully availed themselves of the protections of this forum by incorporating in Delaware. Monsanto Company and Bayer CropScience LP have also availed themselves of the protections of this forum by filing actions in this Court. *See, e.g., Monsanto Co. v. Syngenta Seeds Inc.*, No. 1:04-cv-305 (D. Del.); *Monsanto Co. v. Mycogen Plant Sci., Inc.*, No. 1:96-cv-133 (D. Del.); *Monsanto Co. v. Pharmacia & Upjohn Co.*, No. 1:97-cv-537 (D. Del.); *Bayer CropScience LP v. United Indus. Corp.*, No. 1:03-cv-352 (D. Del.).

13. Venue is proper in this Judicial District under 28 U.S.C. §§ 1391(b) and (c) and 1400(b), at least because Monsanto Company and Bayer CropScience LP are incorporated in Delaware and because Delaware is a convenient forum for resolution of the parties' disputes set forth herein.

IV. THE PATENT IN SUIT

14. The '555 patent, entitled "Herbicide Resistance Genes," was duly and legally issued by the United States Patent and Trademark Office ("USPTO") on March 16, 2021. The '555 patent identifies Terry Wright, Justin Lira, Donald Merlo, and Nicole Arnold as inventors. A true and correct copy of the '555 patent is attached as Exhibit A.

15. The '555 patent issued from U.S. Appl. No. 15/288,406, which was filed on October 7, 2016, and published on January 26, 2017, as U.S. Appl. Publ. No. 2017/0022515. The '555 patent claims priority to U.S. Appl. No. 14/820,893, filed August 7, 2015 (now U.S. Patent No. 10,174,337); U.S. Appl. No. 12/951,813, filed November 22, 2010 (now U.S. Patent No. 9,127,289); U.S. Appl. No. 11/587,893, filed May 22, 2008 (now U.S. Patent No. 7,838,733); Patent Cooperation Treaty Appl. No. PCT/US2005/014737, filed May 2, 2005; and Provisional Appl. No. 60/567,052, filed April 30, 2004.

16. The invention of the '555 patent relates to transgenic plants having resistance to at least two different classes of herbicides: phenoxy auxin herbicides such as 2,4-D and (R)-aryloxyphenoxypropionate herbicides such as quizalofop. The '555 patent's transgenic plants include novel maize and soybean lines. Maize (also known as corn) and soybeans are used as human food, livestock feed, industrial raw materials, and in biofuel production. Maize and soybeans are commercially important crops in the United States.

17. As the '555 patent states, weeds can quickly deplete soil of valuable nutrients, posing a challenge for growers of maize, soybeans, and other crops. Ex. A at 1:21-29. To control weeds, growers have commonly used the herbicide glyphosate (e.g., Roundup®). *See id.* at 1:22-29. During the 1990s, Monsanto introduced genetically engineered Roundup Ready® transgenic crops having glyphosate tolerance so that growers could use glyphosate to control weeds while minimizing harm to their crops. *Id.* at 1:30-53. Glyphosate-tolerant transgenic crops were widely adopted, grown on over 80% of soybean acres and on over 20% of maize acres in the United States. *Id.* at 2:10-19. Over-reliance on glyphosate and glyphosate-tolerant crops, however, led to increasing prevalence of weeds having glyphosate resistance, including both broadleaf and grass weeds. *Id.* at 1:58-2:10.

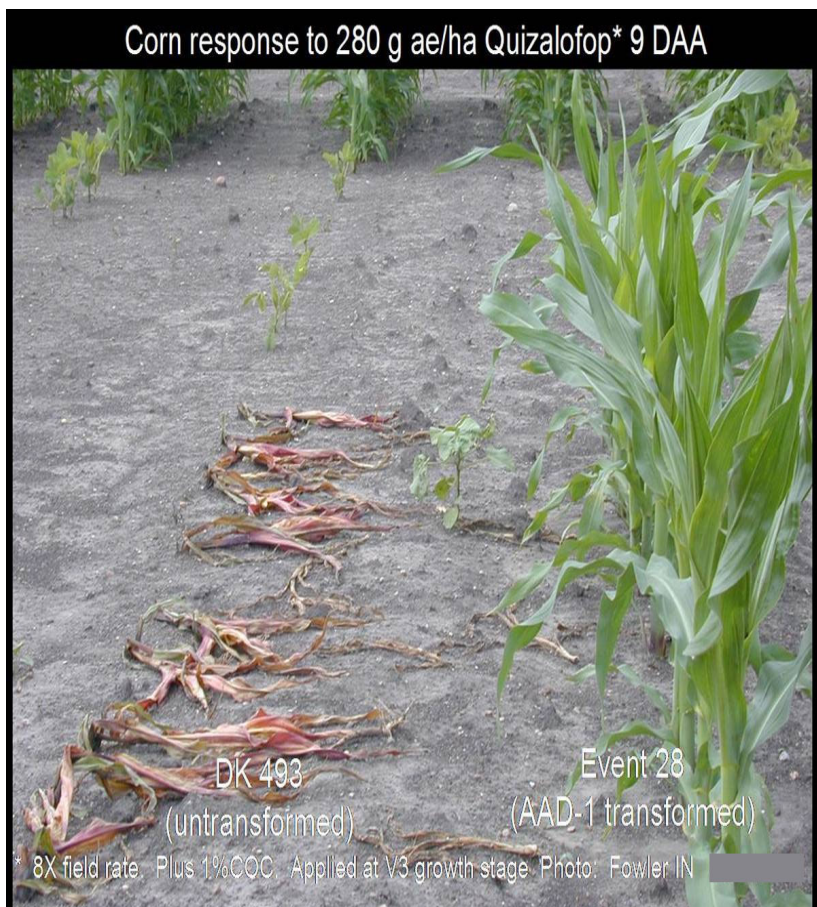
18. In areas where glyphosate-resistant weeds developed, growers could compensate for glyphosate's ineffectiveness by using other herbicides, such as 2,4-D. *Id.* at 2:20-31. But use of 2,4-D was limited due to the sensitivity of certain dicot crops, including soybeans, to this herbicide and due to injury it can cause in monocot crops, such as maize. *Id.* at 2:31-36.

19. Corteva's invention, described in the '555 patent, enables growers to use multiple types of herbicides to control weeds, including glyphosate-resistant weeds. As the '555 patent discloses, the inventors' creation of transgenic plants expressing the bacterial α -ketoglutarate-dependent ("αKG") dioxygenase enzyme RdpA from *Sphingobium herbicidovorans* resulted in a surprising discovery: these novel transgenic plants exhibited dual activity against two different classes of herbicides with different modes of action. *Id.* at 19:34-63. These two classes are (R)-aryloxyphenoxypropionate herbicides (e.g., quizalofop), which target grass weeds, and phenoxy auxin herbicides (e.g., 2,4-D), which target broadleaf weeds. *Id.* at 19:64-20:3.

20. In light of this unique dual herbicide-tolerance activity, the enzymes and genes of the '555 patent are called "AAD-1" (AryloxyAlkanoate Dioxygenase) proteins and genes. *Id.* at 19:52-54, 4:32-46. The '555 patent discloses that AAD-1 proteins beneficially provide "tolerance to combinations of herbicides that would control nearly all broadleaf and grass weeds." *Id.* at 20:13-15. The '555 patent discloses that AAD-1 genes can be "stacked" with other herbicide-resistance genes, including glyphosate-resistance genes, glufosinate-resistance genes, and others to confer resistance to additional herbicides. *Id.* at 17:53-57, 20:15-20.

21. The '555 patent discloses novel transgenic plants and plant cells that comprise a polynucleotide encoding an AAD-1 protein. *Id.* at 18:50-58, 38:65-39:3. These transgenic plants and plant cells include maize and soybeans. *Id.* at 20:63-21:25, 80:10-95:37 (Examples 7-9 describing transgenic maize), 102:1-106:40 (Example 13 describing transgenic soybeans). The

'555 patent reports that transgenic maize expressing an AAD-1 protein exhibits “robust field level resistance to 2,4-D and quizalofop,” thus providing growers with new solutions for controlling weeds, including glyphosate-resistant weeds. *Id.* at 92:49-50. Figure 16 of the '555 patent, for example, depicts the field testing and quizalofop tolerance of transgenic maize expressing an AAD-1 protein as compared to control plants that do not express an AAD-1 protein:



Id. at Fig. 16.

22. The claims of the '555 patent are generally directed to transgenic plants and plant cells comprising a polynucleotide encoding an AAD-1 protein defined by an amino acid sequence motif and 85% amino acid sequence identity to RdpA (i.e., SEQ ID NO: 9), as well as methods of controlling weeds. Claim 1, for example, recites:

1. A transgenic plant cell comprising a recombinant polynucleotide that encodes an AAD-1 protein that exhibits aryloxyalkanoate dioxygenase activity wherein said activity enzymatically degrades a phenoxy auxin herbicide and an (R)-aryloxyphenoxypropionate herbicide, further wherein said AAD-1 protein comprises:

i) an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 9; and

ii) an AAD-1 motif having the general formula of:

$HX_{112}D(X)_{114-137}T(X)_{139-269}H(X)_{271-280}R$, wherein

X_{112} represents a single amino acid at position 112, relative to the sequence of SEQ ID NO: 9;

$(X)_{114-137}$ represents a sequence of 24 amino acids;

$(X)_{139-269}$ represents a sequence of 131 amino acids; and

$(X)_{271-280}$ represents a sequence of 10 amino acids.

23. Dependent claim 6 of the '555 patent recites: "A transgenic plant comprising a plurality of the plant cells of claim 1, wherein expression of said polynucleotide renders said plant tolerant to an aryloxyalkanoate herbicide."

V. DEFENDANTS' INFRINGING TRANSGENIC PLANTS ENCODING AN AAD-1 PROTEIN

24. Defendants have been aware of the '555 patent family disclosing Corteva's invention of transgenic plants and plant cells comprising a recombinant polynucleotide encoding an AAD-1 protein that has dual activity against 2,4-D and quizalofop herbicides. For example, Monsanto's U.S. Patent No. 7,855,326,¹ issued December 21, 2010, cites the WO 2005/107437 publication of Corteva's Patent Cooperation Treaty Appl. No. PCT/US2005/014737, to which the '555 patent claims priority. Monsanto has also cited other Corteva patents and publications within the '555 patent family, including U.S. Patent No. 7,838,733 and U.S. Patent No. 9,127,289, and

¹ On information and belief, Defendant Monsanto Company is the parent of Monsanto Technology, LLC, the assignee of U.S. Patent No. 7,855,326.

the publications of U.S. Appl. No. 12/951,813 (US 2011/0124503) and U.S. Appl. No. 14/820,893 (US 2015/0344903). *See, e.g.*, Monsanto U.S. Patent No. 10,023,874.

25. On January 26, 2017, Corteva's application for the '555 patent published as U.S. Appl. Publ. No. 2017/0022515 (the "2017 publication"). The claims of Corteva's 2017 publication were directed to transgenic plants and plant cells encoding a dual-activity AAD-1 protein having the AAD-1 motif and 85% amino acid sequence identity to RdpA (i.e., SEQ ID NO: 9) and methods of controlling weeds.

26. On information and belief, Defendants used their knowledge of Corteva's invention to make transgenic plants comprising a recombinant polynucleotide encoding dual-activity AAD-1 proteins. On March 3, 2019, Defendants published certain details of their activities in an article by Clayton T. Larue et al., *Development of Enzymes for Robust Aryloxyphenoxypropionate and Synthetic Auxin Herbicide Tolerance Traits in Maize and Soybean Crops*, 75(8) PEST MGMT. SCI. 2086-94 (2019) ("Larue," attached as Exhibit B).

27. In Larue, Defendants reported that they made transgenic maize and soybean plants that express RdpA-variant proteins exhibiting dual activity against 2,4-D and quizalofop herbicides. Ex. B at 2086-87. In explaining their rationale for working with RdpA, Defendants cited an AAD-1 publication by Corteva inventor Terry Wright and his colleagues. *Id.* at 2087, 2094 (citing ref. 9: T.R. Wright et al., *Robust Crop Resistance to Broadleaf and Grass Herbicides Provided by Aryloxyalkanoate Dioxygenase Transgenes*, 107 PROC. NAT'L ACAD. SCI. USA 20240-45 (2010)). Rather than using Corteva's AAD-1 name, Defendants renamed the RdpA homologues as "FT" enzymes (e.g., FT_T and FT_Tv7 enzymes). *Id.* at 2087, 2090, 2092-94.

28. In Larue, Defendants described their field trials using transgenic maize plants expressing an FT_T protein. Defendants reported that the transgenic maize plants exhibited dual

herbicide resistance against quizalofop and 2,4-D as compared to control maize plants that did not express an FT_T protein. *Id.* at 2092-94. Those field tests were performed in Illinois. *Id.* at 2088.



Control FT_T
Treatment: 16x QFOP (1440 g/ha) at both V2 and V4 growth stages.



Control FT_T
Treatment: 16x 2,4-D (18000 g/ha) at both V2 and V4 growth stages.

Id. at 2090 (Fig. 3(b) and 3(d)), 2093 (“In the treatments with QFOP [quizalofop], the control plants were completely killed while . . . [plants expressing FT_T] showed little injury In treatments with 2,4-D, a similar trend as with QFOP was observed”).

29. Defendants also reported in Larue that they transformed a “commercially relevant soybean line” to express FT_T and other FT proteins (FT_Tv7 and FT_Tv3) having dual activity against a synthetic auxin herbicide such as 2,4-D and an aryloxyphenoxypropionate (“FOP”) herbicide such as quizalofop. *Id.* at 2094. Defendants reported that these FT proteins exhibited “FOP activity . . . suitable for robust in-plant tolerance” and “demonstrated 2,4-D tolerance in soybean [plants].” *Id.* at 2092, 2094, 2092 (Table 1), 2093 (Fig. 6). Defendants also reported that, in particular, transgenic soybean plants expressing the FT_Tv7 protein showed “commercially relevant” 2,4-D tolerance in field applications. *Id.* at 2094.

30. Defendants reported in Larue that the amino acid sequences of the FT_T and FT_Tv7 proteins were published in GenBank with the accession numbers MH043112 and MH043115, respectively. *Id.* at 2088.

31. On information and belief, the FT_T protein's amino acid sequence has at least 85% sequence identity with SEQ ID NO: 9 recited in the '555 patent claims. On information and belief, the FT_T protein also has the AAD-1 motif as annotated below.

GenBank Accession No. MH043112 (FT_T Sequence)

```
MHAALTPLTNKYRFIDVQPLTGVLGAEITGVDLREPLDDSTWNEILD AFHTYQVIYFPGQAITNEQHIAFSRRF
GPVDPVPILKSIEGYPEVQMIRREANESSRFIGDDWHTSTFLDAPPAAVVMRAIEVPEYGGDTGFLSMYSAWE
TLSPTMQATIEGLNVVHSATKVFGSLYQATNWRFSNTSVKVMVDVAGDRET VHPLVVTHPVTGRRALYCNQVYC
QKIQGMTDAESKSLQFLYEHATKFDFTCRVRWKKDQVLVWDNLCTMHRAPVDYAGKFRYLTRTTVAGDKPSR
```

HX₁₁₂ D(X)₁₁₄₋₁₃₇ T(X)₁₃₉₋₂₆₉ H(X)₂₇₁₋₂₈₀ R

FIGURE 1

Ex. C (annotations added).

32. On information and belief, the FT_Tv7 protein's amino acid sequence has at least 85% sequence identity with SEQ ID NO: 9 recited in the '555 patent claims. On information and belief, the FT_Tv7 protein also has the AAD-1 motif as annotated below.

GenBank Accession No. MH043115 (FT_Tv7 Sequence)

```
MHAALTPLTNKYRFIDVQPLTGVLGAEITGVDLREPLDDSTWNEILD AFHTYQVIYFPGQAITNEQHIAFSRRF
GPVDPVPILKSIEGYPEVQMIRREANESSRYIGDDWHA STFLDAPPAAVVMRAIEVPEYGGDTGFLSMYSAWE
TLSPTMQATIEGLNVVHSATKVFGSLYQATNWRFSNTSVKVMVDVAGDRET VHPLVVTHPVTGRRALYCNQVYC
QKIQGMTDAESKSLQFLYEHATQFDFTCRVRWKKDQVLVWDNLCTMHRAPVDYAGKFRYLTRTTVAGDKPSR
```

HX₁₁₂ D(X)₁₁₄₋₁₃₇ T(X)₁₃₉₋₂₆₉ H(X)₂₇₁₋₂₈₀ R

FIGURE 2

Ex. D (annotations added).

33. Shortly after publishing Larue, Defendants submitted a Petition to the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture (“APHIS Petition,” attached as Exhibit E) on June 27, 2019. On information and belief, Defendants’ APHIS Petition requests a determination of nonregulated status to permit marketing of maize containing the MON 87429 transgenic event, which encodes the dual-activity FT_T protein Defendants previously described in Larue. Ex. E at 25, 85 (“The FT_T protein produced in MON 87429 is encoded by the *ft_t* gene . . .”).²

34. In the APHIS Petition, Defendants again report that the FT_T protein exhibits the AAD-1 dual activity of degrading a phenoxy auxin herbicide (e.g., 2,4-D) and an (R)-aryloxyphenoxypropionate herbicide (e.g., quizalofop). For example, Defendants state that the FT_T protein degrades quizalofop and 2,4-D into “herbicidally-inactive” compounds. *Id.* at 86; *see also id.* at 43 (“[The] FT_T protein confers tolerance to quizalofop and 2,4-D herbicides.”).

35. On information and belief, Defendants’ APHIS Petition illustrates that the FT_T protein comprises an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 9 (i.e., the sequence of RdpA) recited in the ’555 patent claims. Defendants reported in the APHIS Petition that the “amino acid sequence of the FT_T protein shares ~ 89% sequence identity with wild type RdpA.” *Id.* at 85.

36. Defendants’ APHIS Petition also illustrates that the FT_T protein comprises the structural AAD-1 motif HX₁₁₂D(X)₁₁₄₋₁₃₇T(X)₁₃₉₋₂₆₉H(X)₂₇₁₋₂₈₀R recited in the ’555 patent claims.

² The *ft_t* gene may be stacked with other genes encoding proteins conferring resistance to five or more different herbicides. Ex. E at 25 (APHIS Petition: “The flexibility to use dicamba, glufosinate, quizalofop, 2,4-D and glyphosate and/or combinations of these five herbicides . . . will provide an effective weed management system for maize production.”).

In the APHIS Petition, Defendants disclose the amino acid sequence of the FT_T protein, which on information and belief contains the AAD-1 motif as annotated below.

1	<u>A</u> M <u>H</u> A <u>A</u> L <u>T</u> P <u>L</u> T	<u>N</u> K <u>Y</u> R <u>F</u> I <u>D</u> V <u>Q</u> P	L <u>T</u> G <u>V</u> L <u>G</u> A <u>E</u> I <u>T</u>	G <u>V</u> D <u>L</u> R <u>E</u> P <u>L</u> D <u>D</u>	S <u>T</u> W <u>N</u> E <u>I</u> L <u>D</u> A <u>F</u>
51	H <u>T</u> Y <u>Q</u> V <u>I</u> Y <u>F</u> P <u>G</u>	Q <u>A</u> I <u>T</u> N <u>E</u> Q <u>H</u> I <u>A</u>	F <u>S</u> R <u>R</u> F <u>G</u> P <u>V</u> D <u>P</u>	V <u>P</u> I <u>L</u> K <u>S</u> I <u>E</u> G <u>Y</u>	P <u>E</u> V <u>Q</u> M <u>I</u> R <u>R</u> E <u>A</u>
101	N <u>E</u> S <u>S</u> R <u>F</u> I <u>G</u> D <u>D</u>	W <u>H</u> T <u>D</u> S <u>T</u> F <u>L</u> D <u>A</u>	P <u>P</u> A <u>A</u> V <u>V</u> M <u>R</u> A <u>I</u>	<u>E</u> V <u>P</u> E <u>Y</u> G <u>G</u> D <u>T</u> G	F <u>L</u> S <u>M</u> Y <u>S</u> A <u>W</u> E <u>T</u>
151	L <u>S</u> P <u>T</u> M <u>Q</u> A <u>T</u> I <u>E</u>	G <u>L</u> N <u>V</u> V <u>H</u> S <u>A</u> T <u>K</u>	V <u>F</u> G <u>S</u> L <u>Y</u> Q <u>A</u> T <u>N</u>	<u>W</u> R <u>F</u> S <u>N</u> T <u>S</u> V <u>K</u> V	M <u>D</u> V <u>D</u> A <u>G</u> D <u>R</u> E <u>T</u>
201	V <u>H</u> P <u>L</u> V <u>V</u> T <u>H</u> P <u>V</u>	<u>T</u> G <u>R</u> R <u>A</u> L <u>Y</u> C <u>N</u> Q	V <u>Y</u> C <u>Q</u> K <u>I</u> Q <u>G</u> M <u>T</u>	D <u>A</u> E <u>S</u> K <u>S</u> L <u>L</u> Q <u>F</u>	L <u>Y</u> E <u>H</u> A <u>T</u> K <u>F</u> D <u>F</u>
251	T <u>C</u> R <u>V</u> R <u>W</u> K <u>K</u> D <u>Q</u>	V <u>L</u> V <u>W</u> D <u>N</u> L <u>C</u> T <u>M</u>	<u>H</u> R <u>A</u> V <u>P</u> D <u>Y</u> A <u>G</u> K	F <u>R</u> Y <u>L</u> T <u>R</u> T <u>T</u> V <u>A</u>	G <u>D</u> K <u>P</u> S <u>R</u>

Figure V-2 Deduced Amino Acid Sequence of the FT_T Protein

HX₁₁₂**D**(X)₁₁₄₋₁₃₇**T**(X)₁₃₉₋₂₆₉**H**(X)₂₇₁₋₂₈₀**R**

FIGURE 3

See Ex. E at 86 (Fig. V-2) (color annotations added).

37. On information and belief, since the '555 patent issued on March 16, 2021, Defendants have continued making and using transgenic plants and plant cells having genes that encode dual-activity FT proteins in the United States. On April 28, 2021, for example, an article reported updates on Defendants' APHIS Petition for MON 87429 maize (also called "HT4" maize) and Defendants' continuing development efforts. Emily Unglesbee, *Five-Herbicide Corn Tech: Bayer's Future Five-Way Herbicide-Tolerant Corn Under Review by USDA*, PROGRESSIVE FARMER DTN (Apr. 28, 2021), available at <https://www.dtnpf.com/agriculture/web/ag/crops/article/2021/04/28/bayers-future-five-way-herbicide> (attached as Exhibit F). It states that "Bayer is developing a corn technology that would tolerate in-season applications of five herbicides -- dicamba, 2,4-D, glufosinate, glyphosate and quizalofop." *Id.* It further states that "Bayer has been working on this new, five-way traited corn, which it calls HT4, and is re-focusing much of its

research efforts there.” *Id.* The article quoted Defendants as stating that “we . . . are focusing our resources on our fourth generation herbicide-tolerant corn (HT4) product.” *Id.* The article also quoted Defendants as having paused work on an earlier generation maize product (HT3) in favor of focusing their resources on HT4 maize. *Id.* On information and belief, Defendants’ APHIS Petition currently remains pending at the U.S. Department of Agriculture and has not been withdrawn.

COUNT I: INFRINGEMENT OF THE ’555 PATENT

38. Corteva repeats and realleges each of the foregoing paragraphs as if fully set forth herein.

39. On information and belief, after issuance of the ’555 patent, Defendants have infringed at least claims 1 and 6 of the ’555 patent under 35 U.S.C. § 271(a), either literally or under the doctrine of equivalents, by making and using claimed transgenic plants and plant cells comprising a recombinant polynucleotide encoding a dual-activity AAD-1 protein without authority in the United States.

40. On information and belief, Defendants have made and used transgenic plant cells comprising a recombinant polynucleotide that encodes an AAD-1 protein, as required by claim 1 of the ’555 patent. For example, on information and belief, Defendants’ HT4 (MON 87429) maize plants contain transgenic maize cells comprising a recombinant *ft_t* gene that encodes an AAD-1 protein, renamed by Defendants as an “FT” protein, specifically “FT_T.” Ex. E at 85 (“The FT_T protein produced in MON 87429 is encoded by the *ft_t* gene”); Ex. B at 2087-88, 2093; Ex. F.

41. On information and belief, the encoded FT_T protein exhibits aryloxyalkanoate dioxygenase activity in which the activity enzymatically degrades a phenoxy auxin herbicide and an (R)-aryloxyphenoxypropionate herbicide, as required by claim 1 of the ’555 patent. On

information and belief, the FT_T protein has the AAD-1 dual activity of enzymatically degrading 2,4-D (a phenoxy auxin herbicide) and quizalofop (an (R)-aryloxyphenoxypropionate herbicide) into “herbicidally-inactive” compounds. Ex. E at 85, 86, 43 (“[The] FT_T protein confers tolerance to quizalofop and 2,4-D herbicides.”); Ex. B at 2093.

42. On information and belief, the encoded FT_T protein comprises an amino acid sequence having at least 85% sequence identity with SEQ ID NO: 9, as required by claim 1 of the ’555 patent. Ex. E at 85 (“The amino acid sequence of the FT_T protein shares ~ 89% sequence identity with wild type RdpA . . .”).

43. On information and belief, the encoded FT_T protein also comprises an AAD-1 motif having the general formula $HX_{112}D(X)_{114-137}T(X)_{139-269}H(X)_{271-280}R$ relative to the sequence of SEQ ID NO: 9, as required by claim 1 of the ’555 patent. *See supra* Figs. 1, 3.

44. On information and belief, Defendants have made and used a transgenic plant comprising a plurality of the plant cells of claim 1, in which expression of the recombinant polynucleotide renders the plant tolerant to an aryloxyalkanoate herbicide, as required by claim 6 of the ’555 patent. On information and belief, expression of the *ft_t* gene of Defendants’ transgenic plants produces the FT_T protein, rendering the transgenic plants tolerant to an aryloxyalkanoate herbicide, such as quizalofop or 2,4-D. Ex. E at 4 (“[T]he *ft_t* gene . . . expresses a FOPs and 2,4-D dioxygenase protein (FT_T) that confers tolerance to quizalofop and 2,4-D herbicides.”); *id.* at 85 (“The FT_T protein produced in MON 87429 is encoded by the *ft_t* gene that provides tolerance to aryloxyalkanoate herbicides.”), 43, 86; Ex. B at 2093-94.

PRAYER FOR RELIEF

WHEREFORE, Plaintiff requests that the Court enter judgment in its favor and against Defendants as follows:

A. A judgment that Defendants have infringed at least one claim of the '555 patent under at least 35 U.S.C. § 271(a);

B. An award of damages adequate to compensate Plaintiff for Defendants' past infringement and any continuing or future infringement, including at minimum reasonable royalties, together with interest, costs, expenses, and disbursements as justified under 35 U.S.C. § 284;

C. An order enjoining Defendants, their officers, agents, servants, employees, attorneys, all parent and subsidiary corporations and affiliates, their assigns and successors in interest, and those persons in active concert or participation or privity with Defendants who receive notice of the injunction, from acts of infringement of the '555 patent;

D. An order finding that this is an exceptional case and awarding to Plaintiff its reasonable attorneys' fees and costs pursuant to 35 U.S.C. § 285; and

E. Such other and further relief in law or equity as the Court deems just and appropriate.

DEMAND FOR JURY TRIAL

Pursuant to Federal Rule of Civil Procedure 38(b), Plaintiff demands a trial by jury on all claims and issues so triable.

Dated: August 9, 2022

BARNES & THORNBURG LLP

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